

## Chapter 3 – Status of Sage-grouse Populations and Habitat in Idaho

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## 3 Status of Sage-grouse Populations and Habitat in Idaho

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### 3.1 Broad-scale

#### ***3.1.1 Statewide overview of population status***

Sage-grouse have been monitored in Idaho since the 1950's, though in some areas, data are limited. Overall, from 1965-2003, Idaho's sage-grouse population declined at an average rate of 1.47% per year. The most dramatic decline occurred between 1965-1984, when the sage-grouse population declined by an average rate of 3.04% per year. Between 1985 and 2003, the average decline slowed, to 0.12% annually. In general, Idaho sage-grouse numbers reached a low in the mid 1990s but have increased since that time (Connelly et al. 2004).

Efforts to implement more comprehensive and consistent counts are ongoing. Over time, this should lead to more accurate data on short- and long-term population trends (see Chapter 5 for additional discussion).

#### ***3.1.2 Statewide overview of habitat status***

##### **3.1.2.1 Background**

Landscape ecology is the study of spatial patterns and processes in the environment. An understanding of basic landscape ecology principles is essential for effective conservation planning for sage-grouse and other species since the effects of habitat loss and fragmentation on species' persistence can be substantial. For purposes of this Plan, habitat *loss* occurs when vegetation communities that previously provided suitable habitat, or had the potential to be restored to suitable habitat, are converted permanently or semi-permanently to non-habitat. Some examples include the replacement of sagebrush communities with towns, exurban home sites and intensive agriculture that has occurred along much of Idaho's Interstate Highway corridors and Snake River Plain.

Historically (ca 1850-1890), source habitats<sup>1</sup> for sage-grouse were widespread and continuous over much of the Interior Columbia Basin, particularly in the Columbia Plateau, Northern Great Basin, and Idaho's Owyhee Uplands and Upper Snake Ecosystem Reporting Units (ERUs). This assessment also reported that roughly 48% of the Interior Columbia Basin showed a decline in the extent of sagebrush habitat, with moderate declines estimated for the Owyhee Uplands, and extensive declines in the Upper Snake ERUs (Wisdom et al. 2000).

Agricultural development has played a role in the loss or fragmentation of sage-grouse habitat historically as well as in more recent years. For example, almost all of the basin big sagebrush (*Artemisia tridentata tridentata*) habitat on the Snake River Plain has been converted to cropland (Hironaka et al. 1983).

Habitat *fragmentation* results when larger, contiguous patches of habitat are broken into smaller, more disjunct patches (Morrison et al. 1998), and may or may not lead to habitat loss. For example, a series of wildfires might temporarily fragment a previously contiguous area of sagebrush that provided nesting habitat, but the burned areas may eventually become suitable again naturally or through rehabilitation. In contrast, a ranchette placed within a sagebrush patch is for all intents and purposes permanent, leading to a loss of habitat. Numerous factors interact to influence the response of wildlife to such fragmentation, including habitat patch size and shape, inter-patch distance, edge length and composition, species natural history, patch composition, vegetation structure, and others (Morrison 2002). If fragmentation progresses, patches may eventually become too small to sustain a local population or even individual territories (Fahrig 2003). Also, as fragmentation increases, time spent in the surrounding unsuitable habitat also increases, which may lead to higher mortality rates or decreased productivity (Fahrig 2002). Fragmentation effects on songbirds [and possibly sage-grouse] in shrubland or grassland systems may be most evident in situations where disturbance of a previously homogenous habitat results in a highly contrasting mosaic of suitable and unsuitable habitats, and less so in areas that are naturally heterogeneous (Knick and Rotenberry 2002).

While some basic principles of landscape ecology are described below, further reading is recommended. In addition to the citations noted in this section, other recommended references include Bissonette (1997), Forman (1995), Gutzwiller (2002), and Morrison et al. (1998). Dramstad et al. (1996) provide a very readable, and concise handbook of landscape ecology, and is recommended preliminary

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<sup>1</sup> Note: the term "source habitat" is used in this particular quote as defined in the Interior Columbia Basin Ecosystem Management Plan or ICBEMP as "Those characteristics of macro vegetation that contribute to stationary or positive population growth. Distinguished from habitats associated with species occurrence; such habitats may or may not contribute to long-term population persistence.

reading. Selected key principles illustrated in the book, that conservation planners and habitat managers should be aware of regarding the effects of habitat fragmentation on wildlife are presented below. An interpretation of how each principle applies to sage-grouse conservation planning in Idaho has been added.

- *“The probability of a species becoming locally extinct is greater if a patch is small, or of low habitat quality.”*
  - Interpretation: Sage-grouse populations occupying areas where more extensive sagebrush habitats have become fragmented into smaller patches, or where habitat quality is low are at risk.
- *“The probability of a species going locally extinct is greater in an isolated patch. Isolation is a function not only of distance, but also of the characteristics (i.e., resistance) of the intervening matrix habitat.”*
  - Interpretation: Sage-grouse populations that are isolated from other populations due to large distances and/or unsuitable surrounding habitats are at greater risk of extirpation than populations that can interact.
- *“Removal of a patch causes habitat loss, which often reduces the population size of a species dependent upon that habitat type, and may also reduce habitat diversity, leading to fewer species.”*
  - Interpretation: As areas (patches) of sage-grouse habitat are lost, such as due to cheatgrass conversion, wildfire or other factors, the ability of the landscape to support sage-grouse populations, or other species, may be reduced.
- *“Removal of a patch reduces the size of a metapopulation (i.e., an interacting population subdivided among different patches) thereby increasing the probability of local within-patch extinctions, slowing down the recolonization process, and reducing stability of the metapopulation.”*
  - Interpretation: Loss of habitat patches can hinder the ability of nearby sage-grouse populations to interact or expand.

The loss and fragmentation of sage-grouse habitat in some parts of Idaho are of major concern. Connelly et al. (2004) provided a broad-scale, rangewide analysis of a variety of factors, including a composite analysis of the “human footprint” on the landscape. Fragmentation by anthropogenic features in the Snake River Plain was considered high.

Detailed habitat fragmentation studies in Idaho are scarce. In southwestern Idaho, Knick and Rotenberry (1997) evaluated the effects of various disturbances on landscape characteristics. Fragmentation patterns due to a combination of wildfire and agriculture, or with repeated fires originating from military training, resulted in a landscape where natural recovery of shrublands is likely slow. The presence of cheatgrass, which shortens fire-return intervals and hinders shrubland recovery efforts, was more likely in areas containing high proportions of shrubland/grassland edge or in small shrubland patches. These small shrubland patches, with little interior area, are likely to be completely removed by wildfire, since cheatgrass can easily invade the entire patch (Knick and Rotenberry 1997, Knick and Rotenberry 2000). More recently, Shepherd (2006), examined sage-grouse habitat-use in fragmented and unfragmented habitats in southern Idaho.

### **3.1.2.2 Fragmentation analysis**

Due to the limited availability of landscape-level habitat fragmentation analyses for Idaho, we completed a preliminary analysis described below. Landscapes and ecosystems are complex, thus no single measure of habitat fragmentation should be relied upon in and of itself (Davidson 1998). While numerous techniques are available to describe and quantify aspects of habitat fragmentation, *sagebrush-grassland edge density* and *sagebrush aggregation index* appeared to provide two relatively straightforward and meaningful factors to analyze and portray graphically. The primary purpose of the analysis was to provide LWGs and LWG startup teams additional information, which is not otherwise readily available, to aid in identifying general areas where sage-grouse/sagebrush habitat fragmentation may be of particular concern and thus where they might consider focusing restoration efforts or further study. We used the USGS 2005 Shrubmap digital landcover dataset as a foundation for the analysis. While this analysis provides a general idea of fragmentation patterns, subsequent analyses should be considered as the quality of digital landcover imagery evolves and becomes available. Finer scale (e.g., watershed or other) analyses should also be considered where habitat fragmentation is of particular concern. Quantification of other metrics such as number of sagebrush patches, sagebrush patch size, or other measures of interest may be valuable.

#### **3.1.2.2.1 Edge density**

Edge density (ED) is expressed as the total length of patch edge per unit area (McGarigal and Marks 1995). In this analysis, we focused on ED between sagebrush and grassland vegetation covertypes. By definition, areas of high sagebrush-grassland ED are more fragmented than areas of low sagebrush-grassland ED (i.e.,



contiguous sagebrush). Also, areas of high ED are likely at greater risk for rapid invasion of cheatgrass into sagebrush patches, and wildfire effects (Knick and Rotenberry 1997). When portrayed on a map as a gradient of color (high to low ED), the information can help identify areas where the degree of habitat fragmentation may or may not be of potential concern. While the threshold value at which sagebrush-grassland ED becomes detrimental to sage-grouse is currently unknown, the species' dependence on sagebrush suggests that areas of higher ED may be at risk and warrant additional site-specific analyses.

#### 3.1.2.2.1.1 Edge density methods

Sagebrush-grassland ED was quantified in ft/acre and spatially mapped across all SGPAs using GIS in conjunction with the computer program FRAGSTATS<sup>2</sup> Version 3 (McGarigal et al. 2002). For a base vegetation map, we reclassified the USGS 2005 Shrubmap regional landcover dataset<sup>3</sup>, by collapsing the covertypes into four classes, "Sagebrush", "Grassland", "Pinyon-Juniper", and "Other." "Sagebrush" is defined in Shrubmap as a pixel (30 x 30 m) comprised of at least 10% total shrub cover, with sagebrush being the dominant shrub. The aggregated "Sagebrush" class included all sagebrush types in Shrubmap, relevant to Idaho. The aggregated "Grassland" class included all perennial and annual grassland types defined by Shrubmap, as well as those defined as "recently burned." Pinyon-juniper types were also combined as a single class due to interest in this coctype in Idaho. All remaining covertypes were combined into a single class labeled "Other." Neither "pinyon-juniper" nor "Other" classes were included in the ED analysis, though they were portrayed in the final map product for reference. We completed an accuracy assessment (Table 3-1) of the reclassified, combined covertypes, based on an evaluation of accuracies published for USGS Shrubmap. User accuracies for most coctype classes was acceptable (>75%). For the ED map product, ED was calculated using a 180 m moving window, within which the linear interface of sagebrush and grassland covertypes was quantified. While any range of moving window search radii could have been utilized, 180 m, in contrast to 1000 m, appeared to yield more meaningful map resolution.

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<sup>2</sup> FRAGSTATS is a computer software program designed to compute a variety of landscape metrics. The original version was released to the public domain in 1995 as a USDA Forest Service General Technical Report (McGarigal and Marks. 1995), and has since been updated. [<http://www.umass.edu/landeco/>]

<sup>3</sup> A new regional vegetation cover dataset, "Shrubmap" was published in September 2005 on SAGEMAP. The longer title is "*Current distribution of sagebrush and associated vegetation in the Columbia Basin and Southwestern Regions*". Multi-season satellite imagery, using 1999-2003 Landsat 7 ETM+, and digital elevation model derived datasets (e.g. elevation, landform, aspect, etc.) were used to derive rule sets for the various landcover classes. For additional details, review the associated metadata also posted on SAGEMAP. [<http://sagemap.wr.usgs.gov/>]

**Table 3-1 Accuracy (%) assessment for reclassified USGS Shrubmap covertypes used in the edge density and contagion analysis.**

<b>Shrubmap Geographic Area</b>	<b>SGPAs Represented</b>	<b>Grassland</b>	<b>Sagebrush</b>	<b>Pinyon- Juniper</b>	<b>Other</b>	<b>Overall</b>
<b>Southeast Idaho</b>	Curlew, EIU, SMV	46.15	81.93	75.00	87.31	81.40
<b>Lost River</b>	US, Chal	62.50	89.82	100.00	97.84	93.37
<b>Snake River Plain</b>	WC, MH, WMV, EMV, BD	96.67	93.04	100.00	97.42	95.27
<b>Sawtooth</b>	N/A	70.27	84.77	N/A	93.05	88.37
<b>Owyhee Uplands *</b>	Ow, Jar, SB	100	100	100	100	100
<b>Basin and Range*</b>	Ow	83.33	95.27	100.00	93.75	94.48

\* Comparatively few validation sites were available in these areas. Refinement of the landcover map using additional information is in progress.

#### **3.1.2.2.1.2 Edge density results**

Sagebrush-grassland ED is shown in Figure 3-1 for all SGPAs. Areas of high grassland-sagebrush ED are portrayed as orange-red. These areas imply relatively high sagebrush/grassland interface or patchiness and greater risk to sage-grouse habitat integrity. Opportunities may exist for restoration however, as sagebrush seed sources are present. Protection from wildfire coupled with sagebrush restoration efforts could eventually decrease sagebrush patchiness, though understory quality needs to be considered as well. Where these areas also interface with larger, (yellow) grasslands, impacts on sage-grouse may be of particular concern, due to the apparent limited availability of sagebrush on the landscape (e.g., see especially, portions of the West Central, East Magic Valley, Big Desert, Jarbidge).

Extensive areas with low sagebrush-grassland ED (dark green) are also evident, such as in most of the Upper Snake and Challis SGPAs, as well as portions of other SGPAs. Maintaining the integrity of these larger sagebrush landscapes should be considered a management priority. The interpretation of ED for some parts of the state, such as southeastern Idaho should be done with caution, as user accuracy for grasslands is low compared to other parts of the state (Table 3-1).

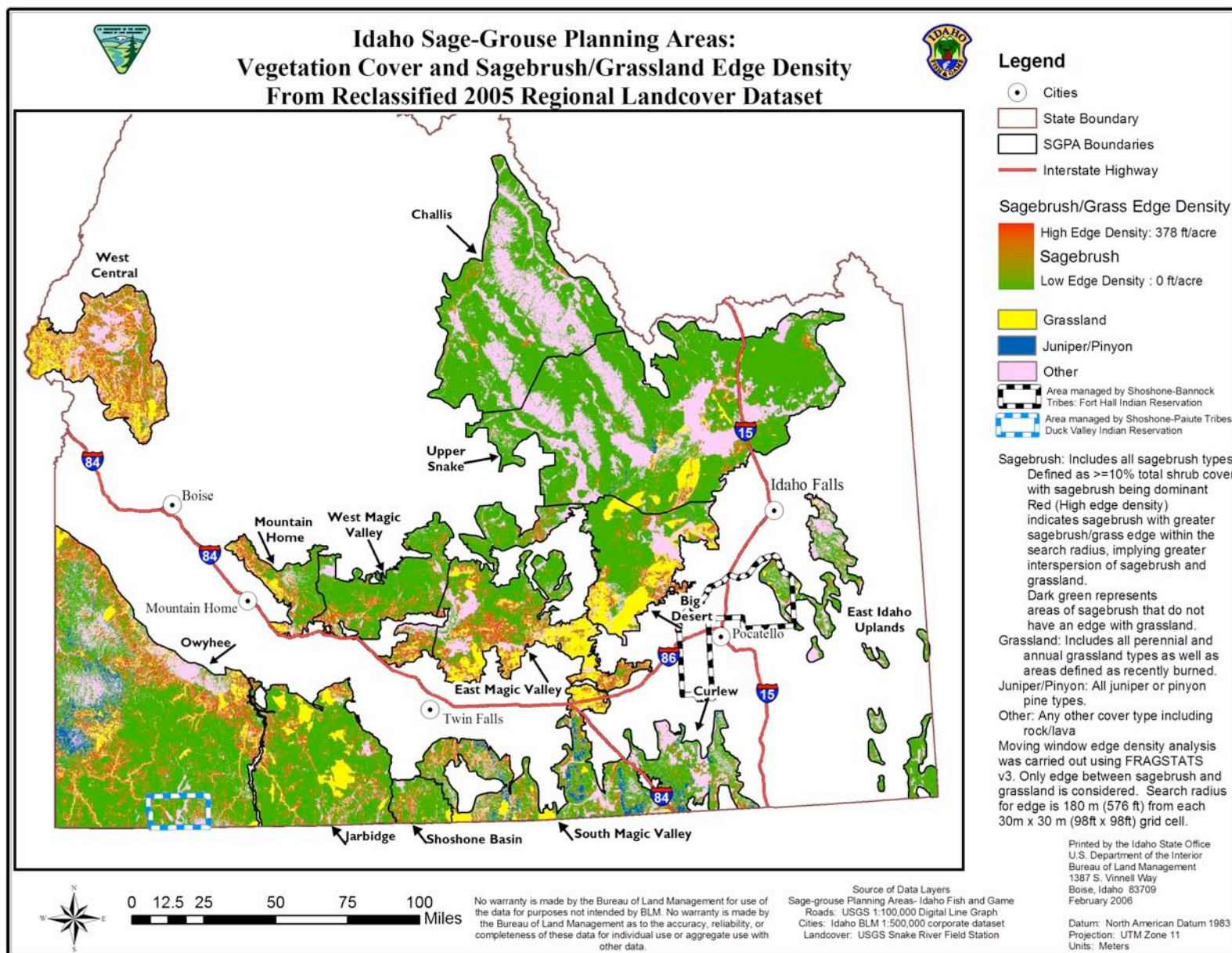


Figure 3-1 Idaho Sage-grouse Planning Areas: Vegetation cover and sagebrush/grassland edge density from reclassified 2005 regional landcover dataset.

#### 3.1.2.2.2 Aggregation Index

For this analysis, aggregation index, or AI, (He et al. 2000) provides a means of evaluating the clumpiness or aggregation of sagebrush covertypes on the landscape. Areas with high AI reflect a high degree of adjacency of sagebrush map pixels, and therefore a high degree of aggregation. Areas with low AI occur when pixels show little adjacency, and thus are disaggregated. While the edge density analysis quantified sagebrush-grassland edge, sagebrush AI reflects the degree of aggregation of sagebrush, independent of other vegetation classes. AI values range from 0% (i.e., no adjacency of sagebrush pixels, and high fragmentation or patchiness) to 100% (i.e., maximum aggregation, with contiguous sagebrush). By definition, areas of high sagebrush AI are more contiguous and thereby less fragmented than are areas of low sagebrush AI. Areas with a high AI are assumed to provide more available sagebrush for sage-grouse than areas of low AI, though ecological site potential plays a role. That is, while some areas may reflect a low AI due to fragmentation of sagebrush communities due to wildfire or human impacts, other areas may naturally have a low sagebrush AI due to variability in site potential and a diversity of covertypes.

When portrayed on a map as a gradient of color from low AI (red) to high AI (dark green), the information can help identify areas where sagebrush aggregation (or lack thereof), may or may not be of potential concern. While the threshold value at which lower sagebrush AI's becomes detrimental to sage-grouse is currently unknown, the species' dependence on sagebrush suggests that areas of lower AI may provide less desirable habitat and warrant additional site-specific analyses, again, assuming the site potential should otherwise support a greater extent of sagebrush.

#### 3.1.2.2.1 Aggregation index methods

Sagebrush AI was quantified and spatially mapped across all SGPAs using GIS in conjunction with the computer program FRAGSTATS<sup>4</sup> Version 3 (McGarigal et al. 2002). For a base vegetation map, we reclassified the USGS 2005 Shrubmap regional landcover dataset<sup>5</sup>, by collapsing the covertypes into two classes, "Sagebrush", and

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<sup>4</sup> FRAGSTATS is a computer software program designed to compute a variety of landscape metrics. The original version was released to the public domain in 1995 as a USDA Forest Service General Technical Report (McGarigal and Marks. 1995), and has since been updated. <http://www.umass.edu/landeco/>

<sup>5</sup> A new regional vegetation cover dataset, "Shrubmap" was published in September 2005 on SAGEMAP. The longer title is "*Current distribution of sagebrush and associated vegetation in the Columbia Basin and Southwestern Regions*". Multi-season satellite imagery, using 1999-2003 Landsat 7 ETM+, and digital elevation model derived datasets (e.g. elevation, landform, aspect, etc.) were used

“Other”. “Sagebrush” is defined in Shrubmap as a pixel (30 x 30 m) comprised of at least 10% total shrub cover, with sagebrush being the dominant shrub. The aggregated “Sagebrush” class included all sagebrush types in Shrubmap, relevant to Idaho. All remaining covertypes were combined into a single class labeled “Other.” The “Other” class was not analyzed for AI, though it appears in the final map product for reference. See Table 3-1 and the related discussion in edge density for information related to the accuracy assessment of the collapsed sagebrush covertypes. For the AI map product, AI was calculated using a 180 m moving window.

#### **3.1.2.2.2 Aggregation index results**

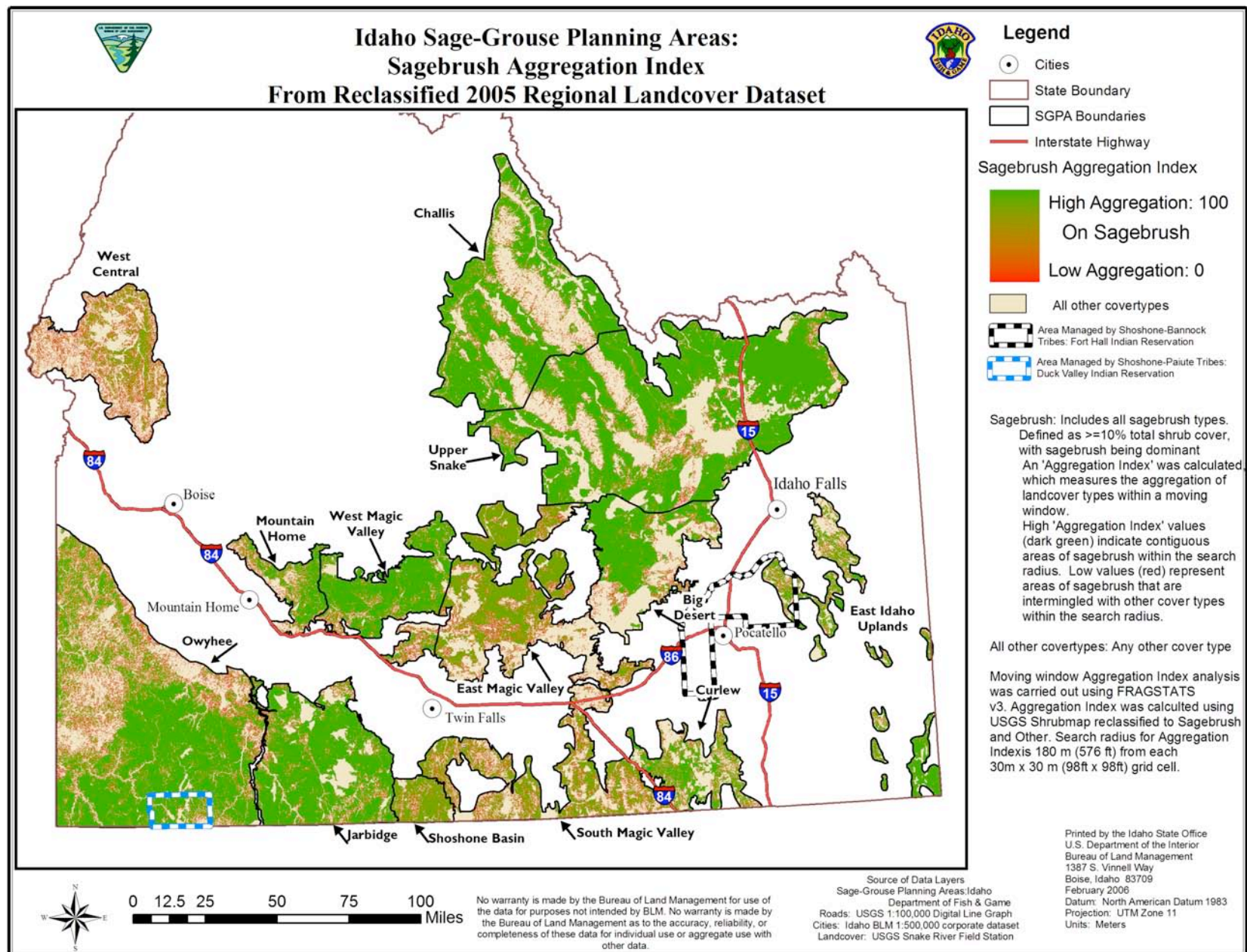
Sagebrush AI was spatially portrayed across all SGPAs as a color gradient from low AI (red) to high AI (green) (Figure 3-2). Red areas imply relatively higher sagebrush patchiness and greater risk to sage-grouse habitat integrity. In these areas, opportunities may exist for restoration and expansion of sagebrush aggregation, since sagebrush seed sources are present. However understory quality needs to be considered as well. As with the higher sagebrush-grassland edge density areas, protection from wildfire coupled with appropriate restoration efforts could eventually increase AI (i.e., increase sagebrush aggregation). All SGPAs harbor at least some areas of low AI (red; low degree of sagebrush aggregation), but in some (e.g., West Central, Owyhee, East Magic Valley, South Magic Valley) some extensive areas are evident.

Relatively extensive areas with higher sagebrush AI (dark green; high sagebrush aggregation) are also evident, such as in much of the Upper Snake, and Challis and portions of the Big Desert, West Magic Valley, Jarbidge and Owyhee SGPAs. Maintaining the integrity of these larger sagebrush landscapes should be considered a management priority.

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to derive rule sets for the various landcover classes. For additional details, review the associated metadata also posted on SAGEMAP. [<http://sagemap.wr.usgs.gov/>]





**Figure 3-2 Idaho Sage-grouse Planning Areas and sagebrush aggregation index from reclassified 2005 regional landcover dataset.**

### 3.1.2.2.3 Fragmentation analysis summary

The information provided here should be considered preliminary, due to the broad-scale nature of the analysis, and limitations in thematic map imagery. Where apparent high edge densities of sagebrush-grassland vegetation types, and/or where low sagebrush aggregation indices have been identified, LWGs should pursue further analyses and field mapping at finer scales (e.g., 1:100,000 to 1:24,000). This is necessary since, in some cases, these index values may be a function of local ecological site variability or mapping/ imagery errors. Alternatively, they may be driven by factors such as cheatgrass, wildfire or human activities that warrant management intervention.

## 3.2 Mid-scale

Spatial analysis of sage-grouse habitat in Idaho, based on a gross comparison of historical habitat (Schroeder et al. 2004), with Idaho's 2004 Sage Grouse Habitat Planning Map suggest that approximately 14.5 million (14,522,755) acres of sage-grouse habitat have been lost, with approximately 13.3 million acres of key habitat and potential restoration areas (perennial grasslands, annual grasslands, conifer encroachment areas) remaining (USDI BLM 2004a). The majority (63%) of current key sage-grouse habitat in Idaho is comprised of lands administered by the BLM. Private lands collectively comprise a smaller though significant proportion (19%) of key habitat. State, USFS, and DOE lands collectively provide 18%. Other land ownerships (National Park Service [NPS], Bureau of Indian Affairs [BIA], Department of Defense [DOD], and USFWS) collectively contribute approximately 1% (Table 3-2).

Table 3-2 Extent of existing key sage-grouse habitat in Idaho as of June 2004<sup>6</sup>

Land status	Acres by status	Percent of total
BLM	5,684,923	63
Private	1,705,475	19
State	636,712	7
USFS	502,439	6
DOE	385,227	4
Other	98,116	1
<b>Total</b>	<b>9,012,892</b>	<b>100</b>

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<sup>6</sup> Source: USDI-BLM 2004a.

### **3.2.1 SGPA population and habitat status**

The following information summarizes the status of sage-grouse habitat and populations by each of Idaho's 13 SGPAs, based on the best-available information.

#### **3.2.1.1 Background population status**

Population trend information for sage-grouse is conducted by recording the high count of males on established leks or lek routes each spring. The quality of lek data in Idaho varies greatly. Data for some areas has been collected consistently for many years. In other areas, data were collected inconsistently, thus not allowing an accurate evaluation of population trends. In this section, lek data are presented for areas where lek routes have been consistently monitored for at least 20 years. Although most SGPA's have inconsistent counts, all lek data should be carefully evaluated by each LWG to determine its quality and what might be done to improve collection of lek data using the techniques outlined in Chapter 5.

#### **3.2.1.2 Background habitat Status**

Habitat figures and SGPA maps shown in the sections to follow reflect several broad covertypes and land ownership status, based on the 2004 version of the Idaho Sage-grouse Habitat Planning Map. This map was initially developed cooperatively by BLM, IDFG and other partners in 2000, to facilitate wildland fire suppression planning and other habitat conservation efforts. It has been periodically updated and refined, based on annual wildfire activity and other factors. Accuracy and precision of the map varies. Some polygons, such as certain perennial or annual grasslands resulting from recent wildfires reflect relatively high precision and accuracy, since boundaries of BLM rangeland wildfires are routinely mapped using GPS and GIS technology. Large areas of the map, however, represent only the best current approximation of general habitat status, based on interdisciplinary or interagency input.

The map is a work in progress and will continue to evolve as mapping technology improves and as habitat changes occur. It will be up to each LWG to identify needed changes, alterations, or additions to the current habitat planning maps during the scheduled annual updates each fall/winter so that appropriate changes can be made in a timely manner prior to the next field (fire) season. See the Chapter 5 for additional details.



Covertypes definitions include:

- ***Key Sage-grouse Habitat:*** Areas of generally intact sagebrush that provide sage-grouse habitat during some portion of the year.
- ***Potential Restoration Areas:***
  - **Type I. Perennial Grassland:** Sagebrush-limited areas characterized by perennial grass species composition and/or structure that should provide suitable potential nesting habitat in the future, once sufficient sagebrush cover is re-established (at least 10% canopy cover). Includes areas characterized by native and/or introduced perennial bunchgrasses.
  - **Type II. Annual Grassland:** Areas dominated or strongly influenced by invasive annuals such as cheatgrass (*Bromus tectorum*) or medusahead rye (*Taeniatherum caput-medusae*) or similar species. Areas with sagebrush may be present, but, in general, understories are not suitable for sage-grouse. Reclassify as Perennial Grassland once restoration seedings are determined to be successful.
  - **Type III. Conifer Encroachment:** Areas where junipers (*Juniperus* spp.) and/or other conifer species are encroaching into sage-grouse habitat areas.

Acreage figures reported below reflect approximate total acreages of combined Key and Potential Restoration Areas within each SGPA, and proportion of this total, by land ownership. Areas of non-habitat are excluded in order to focus planning efforts on habitats relevant to sage-grouse. Consequently, total acreage and land status figures reported below for some SGPAs are less than if all lands and habitats within the SGPA boundaries had been included.

The habitat figures were derived from the July 2004 edition of the Idaho Sage-grouse Habitat Planning map via GIS query (USDI-BLM 2004a). The 2004 edition incorporated fire polygons through the 2003 fire season and is not inclusive of fires or other habitat alterations that may have occurred in summer 2004 or later. It does, however, incorporate several relatively minor polygon edits suggested in spring 2004 for portions of the Upper Snake; Big Desert; and East, West, and South Magic Valley SGPAs. Because of the fluid nature of habitat conditions and landscape threats such as wildfire, and time-lags associated with annual updates to the map, acreage figures reported here are mainly for context, and should not be considered as absolute.

### 3.2.1.3 Big Desert SGPA

#### 3.2.1.3.1 Population

Figure 3-3 shows the average number of males per lek counted (includes all leks counted with zeros) from 1964-2005. The data used to develop Figure 3-3 includes all lek counts along the Big Desert lek routes (Big Desert # 1, Big Desert # 3, Big Desert # 5, South Big Desert, and Fingers Butte).

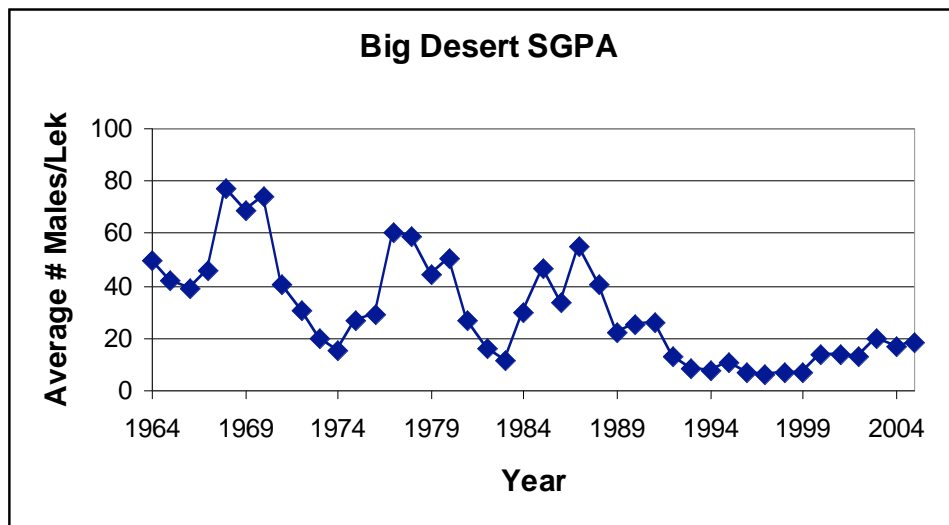
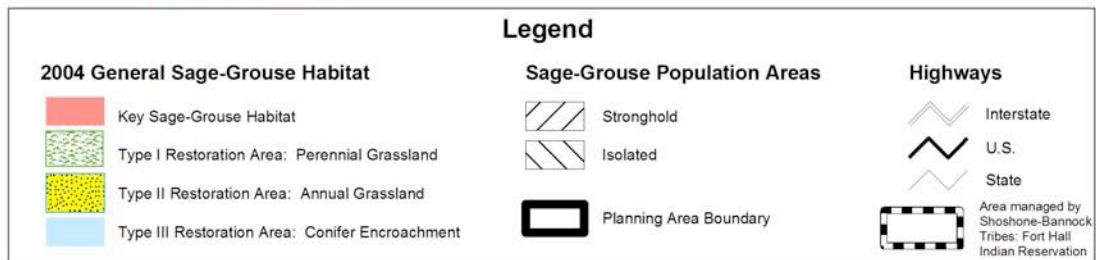
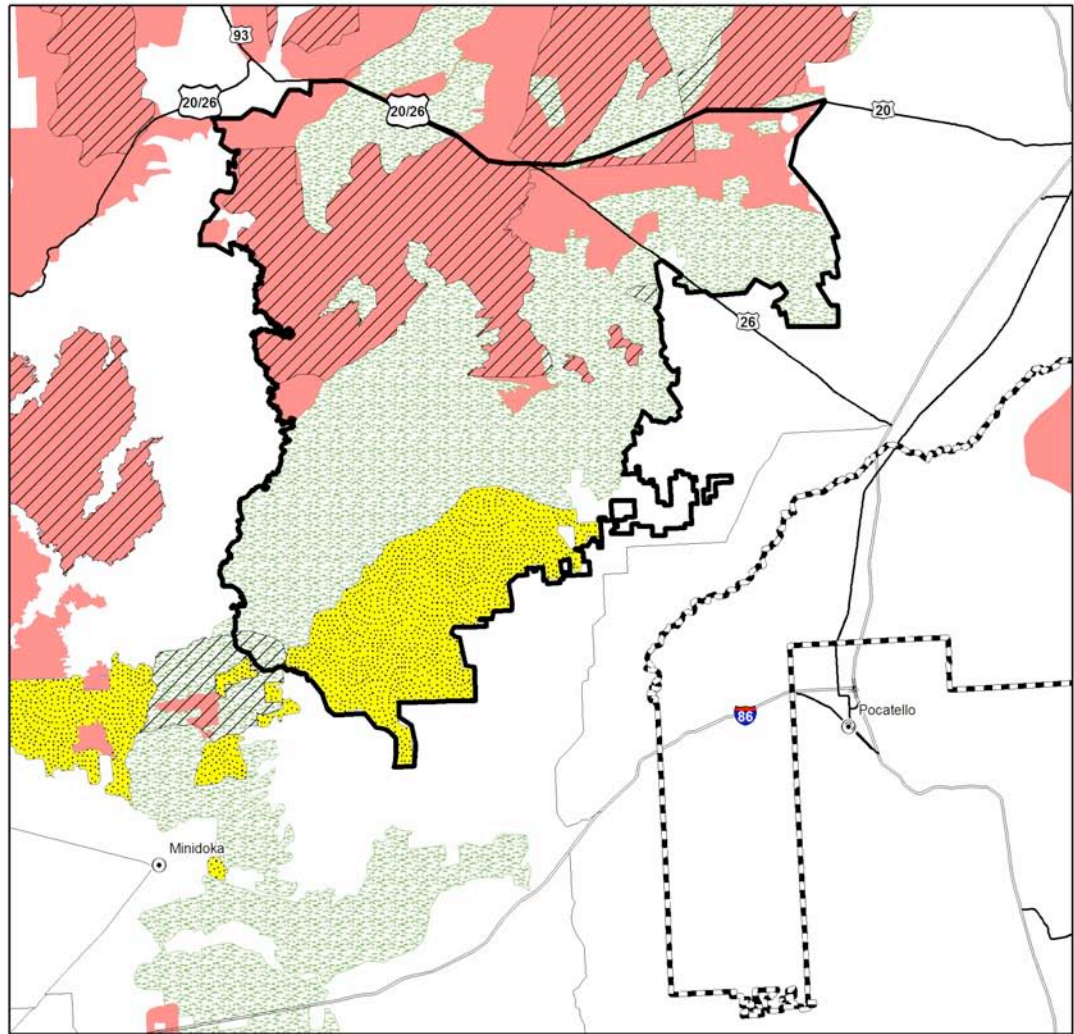


Figure 3-3 Changes in average number of males/lek 1964-2005, Big Desert Sage-grouse Planning Area.

#### 3.2.1.3.2 Habitat

The sage-grouse habitat within the Big Desert SGPA (Figure 3-4) is about 850,000 acres in size. Thirty-four percent of the area is classified as key sage-grouse habitat, 51% is dominated by perennial grassland and 15% is annual grasslands. The Bureau of Land Management (including lands within the Craters-of-the-Moon National Monument boundary) administers 76% of the sage-grouse habitat within the area, 7% is administered by the Department of Energy, 7% is private, 10% is managed by the State, and <1% is managed by the National Park Service.

# Big Desert Sage-Grouse Planning Area: 2004



Source of Data Layers:  
 General Sage-Grouse Habitat and Population Areas, Sage-Grouse Planning Areas: Idaho Department of Fish & Game 1:100,000 datasets  
 Roads: USGS 1:100,000 Digital Line Graph

Printed by the Idaho State Office  
 U.S. Department of the Interior  
 Bureau of Land Management  
 1387 S. Vinnell Way  
 Boise, Idaho 83709  
 January 2006

5 2.5 0 5 10 15 20 25 Miles

Datum: North American Datum 1983  
 Projection: UTM Zone 11  
 Units: Meters



No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by BLM. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

**Figure 3-4 Map of Big Desert Sage-grouse Planning Area, 2004**

### **3.2.1.4 Challis SGPA**

#### **3.2.1.4.1 Population**

Lek data collected within the Challis SGPA are too inconsistent to develop a trend graph. Some individual leks were counted annually between 1985 and 2005 in the Lemhi drainage. However, the individual leks were part of established lek routes that were not all counted on the same morning.

#### **3.2.1.4.2 Habitat**

The sage-grouse habitat within the Challis SGPA (Figure 3-5) is about 878,000 acres in size. The Bureau of Land Management administers 81% of the sage-grouse habitat within the area, 9% is private, 5% is managed by the State, and 5% is administered by USDA Forest Service. Ninety-nine percent of the area is classified as key sage-grouse habitat and 1% is dominated by perennial grassland. Conifer Encroachment Areas likely exist, but have not been incorporated into the Sage-Grouse Habitat Planning Map as of 2004. It should be noted that the Challis and Upper Snake LWG Plans both address habitat in the Big Lost drainage, from Willow Creek Summit to Pass Creek.

# Challis Sage-Grouse Planning Area: 2004

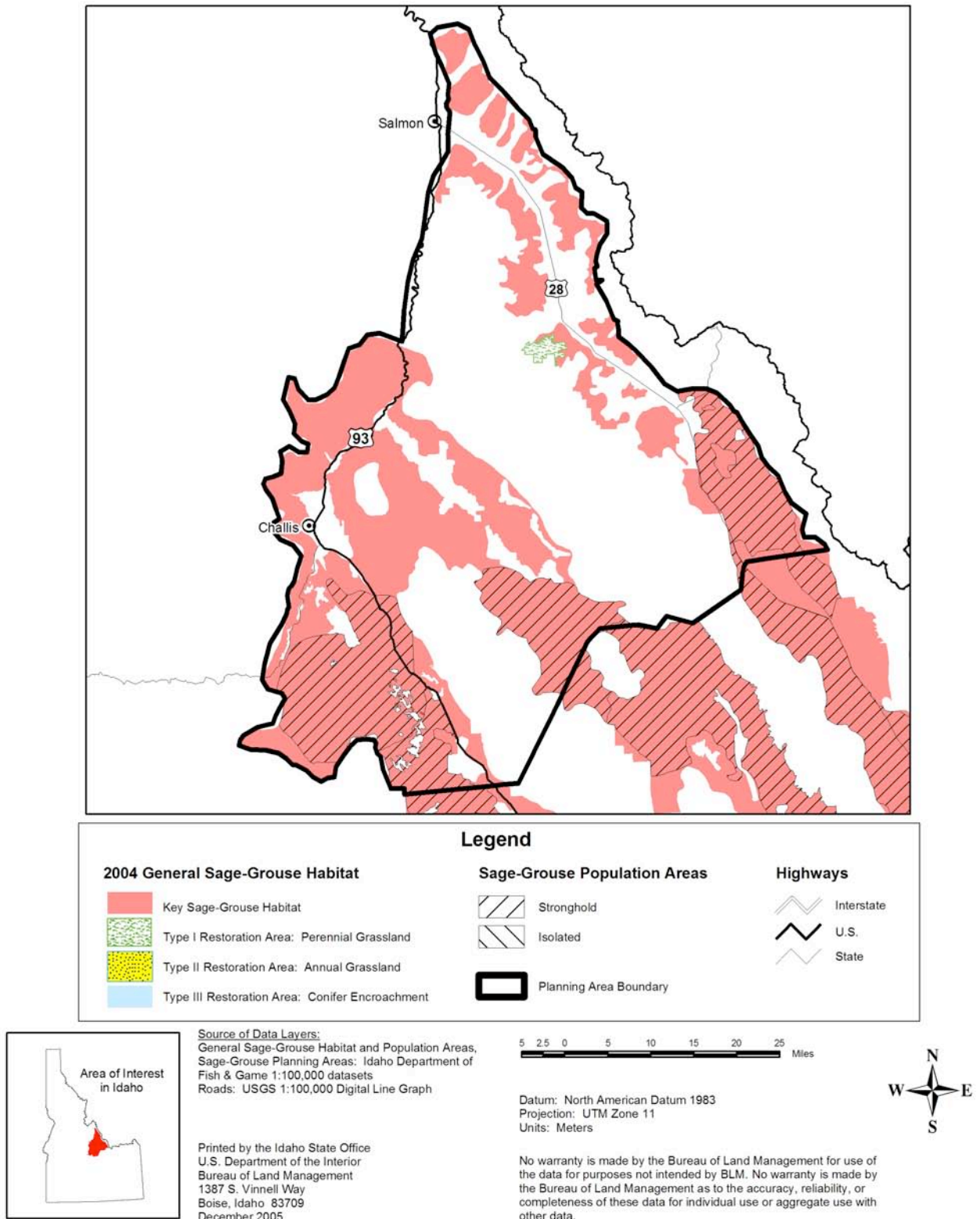


Figure 3-5 Map of Challis Sage-grouse Planning Area, 2004



### **3.2.1.5 Curlew SGPA**

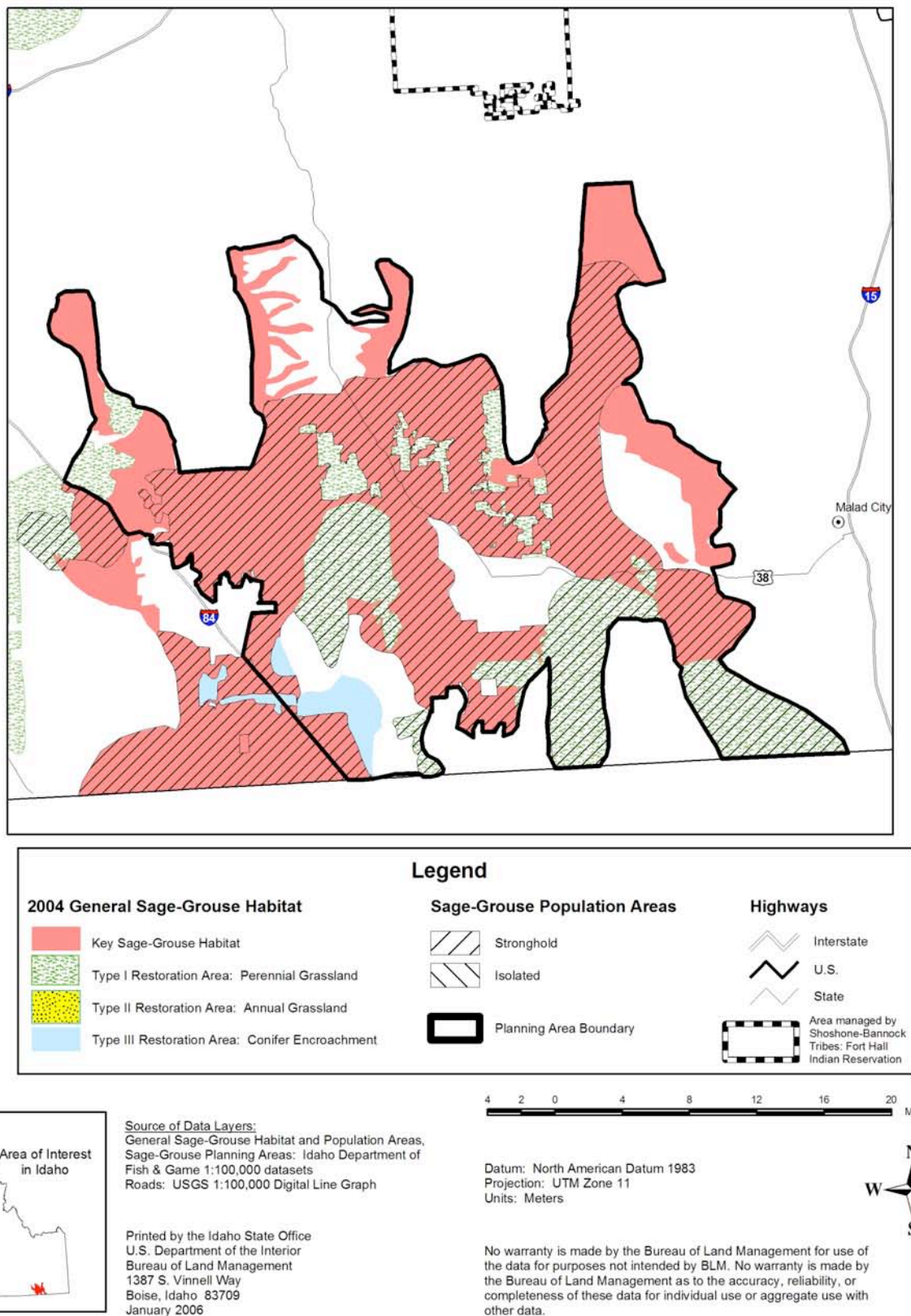
#### **3.2.1.5.1 Population**

Lek data collected within the Curlew SGPA are too inconsistent to develop a trend graph. Two lek routes established during the late 1980s (Curlew and Rockland) were not counted annually until 1996.

#### **3.2.1.5.2 Habitat**

The sage-grouse habitat within the Curlew SGPA (Figure 3-6) is about 394,000 acres in size. The Bureau of Land Management administers 53% of the sage-grouse habitat within the area, 30% is private, 3% is managed by the State, and 14% is managed by USDA Forest Service. Seventy-two percent of the area is classified as key sage-grouse habitat, 26% is dominated by perennial grassland, and 2% is conifer encroachment area.

# Curlew Sage-Grouse Planning Area: 2004



**Figure 3-6 Map of Curlew Sage-grouse Planning Area, 2004**

### 3.2.1.6 East Idaho Uplands SGPA

#### 3.2.1.6.1 Population

Only one lek route was established within the East Idaho Uplands SGPA. This route, in Caribou County, east of Soda Springs was consistently counted from 1980-2003. Figure 3-7 shows the average number of males/lek (includes lek counts with zeros) within the Caribou County lek route only. Other leks have been counted sporadically in Bear Lake and Bingham Counties. However, there is not enough information to document trends for the rest of the SGPA.

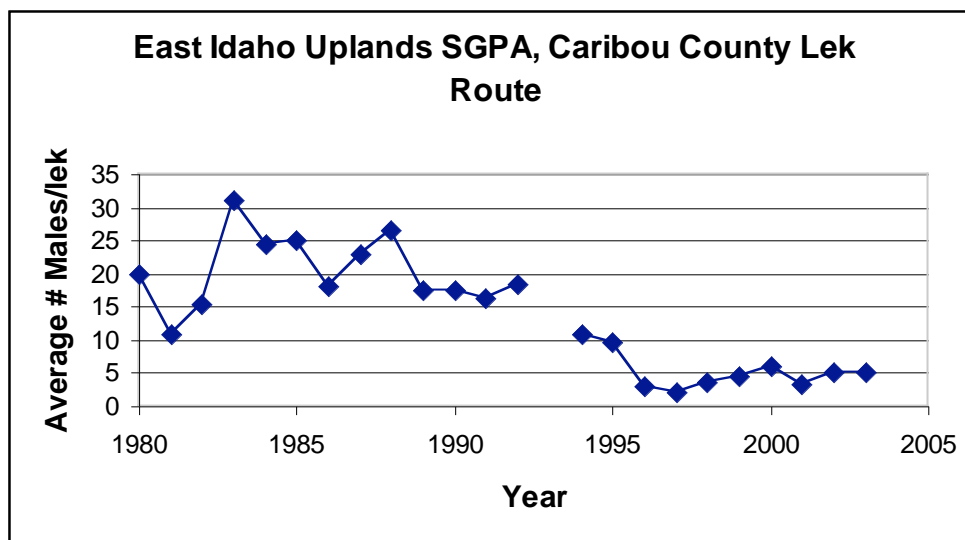


Figure 3-7 Changes in average number of males/lek 1980-2003, Caribou County lek route within the East Idaho Uplands Sage-grouse Planning Area.

#### 3.2.1.6.2 Habitat

The sage-grouse habitat within the East Idaho Uplands SGPA Planning Area (Figure 3-8) is about 520,000 acres in size and encompasses numerous isolated areas of sagebrush (mountain ranges weave in and out of sagebrush meadows). BLM manages approximately 15% of the SGPA; 56% is private, 16% is managed by the State, and 2% is administered by the Bureau of Reclamation. Approximately 11% of the SGPA occurs within the boundaries of the Fort Hall Indian Reservation, an area managed by the Shoshone-Bannock Tribes. The USDA Forest Service and U. S. Fish and Wildlife Service administer less than 1%. Ninety-seven percent of the planning area is classified as key sage-grouse habitat and 3% is annual grasslands.



# East Idaho Uplands Sage-Grouse Planning Area: 2004

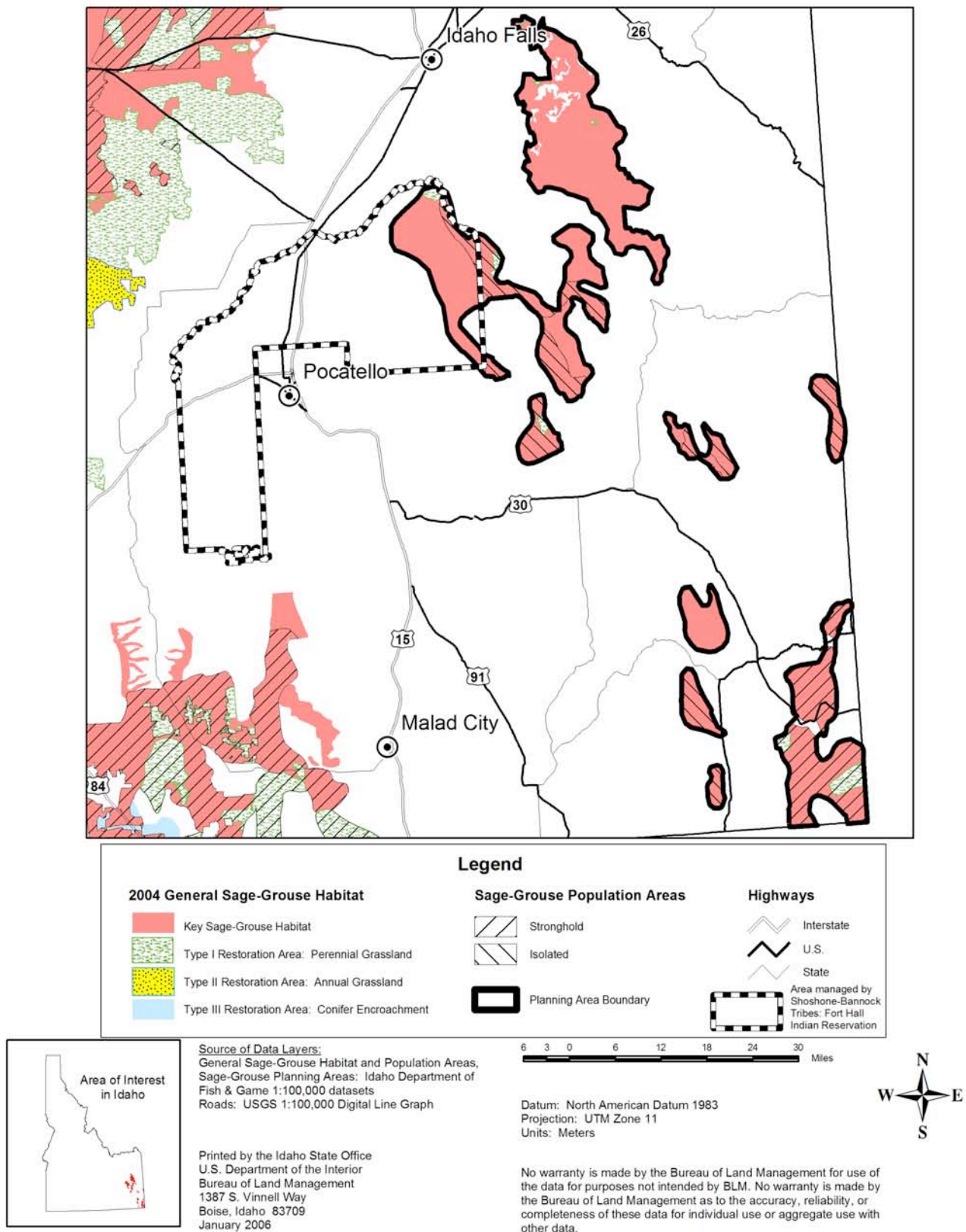


Figure 3-8 Map of East Idaho Uplands Sage-grouse Planning Area, 2004

### 3.2.1.7 East Magic Valley SGPA

#### 3.2.1.7.1 Population

Figure 3-9 shows the average number of males per lek counted (includes all leks counted with zeros) from 1979-2005. The data used to develop Figure 3-9 includes all lek counts along the East Magic Valley lek routes (Timmerman, Paddleford Flats, Picabo, and Lincoln Minidoka).

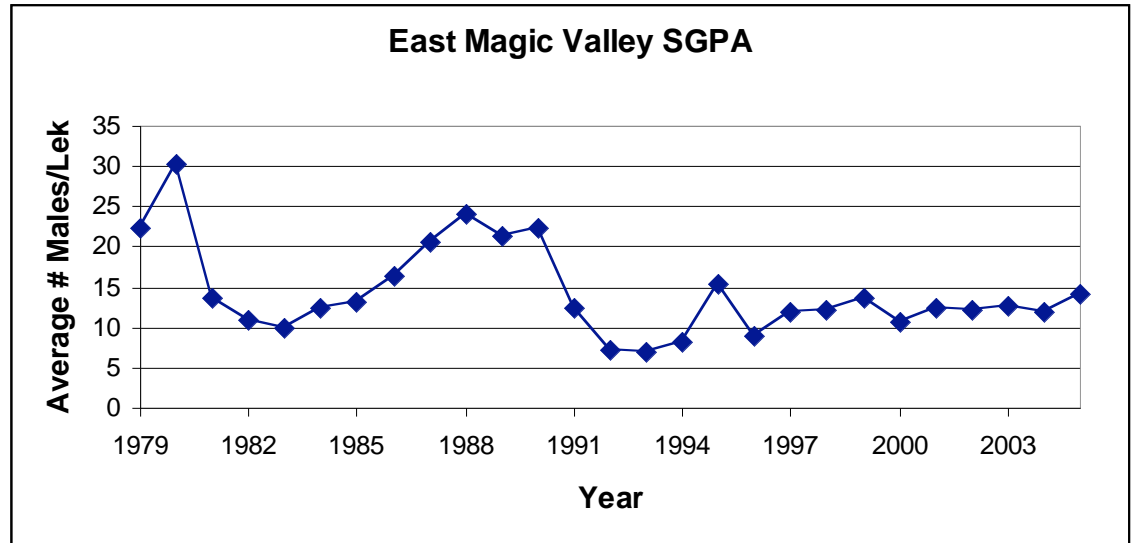


Figure 3-9 Changes in average number of males/lek 1979-2005, East Magic Valley Sage-grouse Planning Area.

#### 3.2.1.7.2 Habitat

The sage-grouse habitat within the East Magic Valley SGPA (Figure 3-10) is about 1.3 million acres in size. The Bureau of Land Management (including BLM lands within the Craters-of-the-Moon National Monument boundary) administers 80% of the sage-grouse habitat within the area, 2% is managed by the National Park Service, 12% is private, and 6% is managed by the State. Less than 1% of the area is administered by USDA Forest Service, U.S. Fish and Wildlife Service, and other. Forty-two percent of the area is classified as key sage-grouse habitat, 39% is dominated by perennial grassland, and 19% is annual grasslands.

# East Magic Valley Sage-Grouse Planning Area: 2004

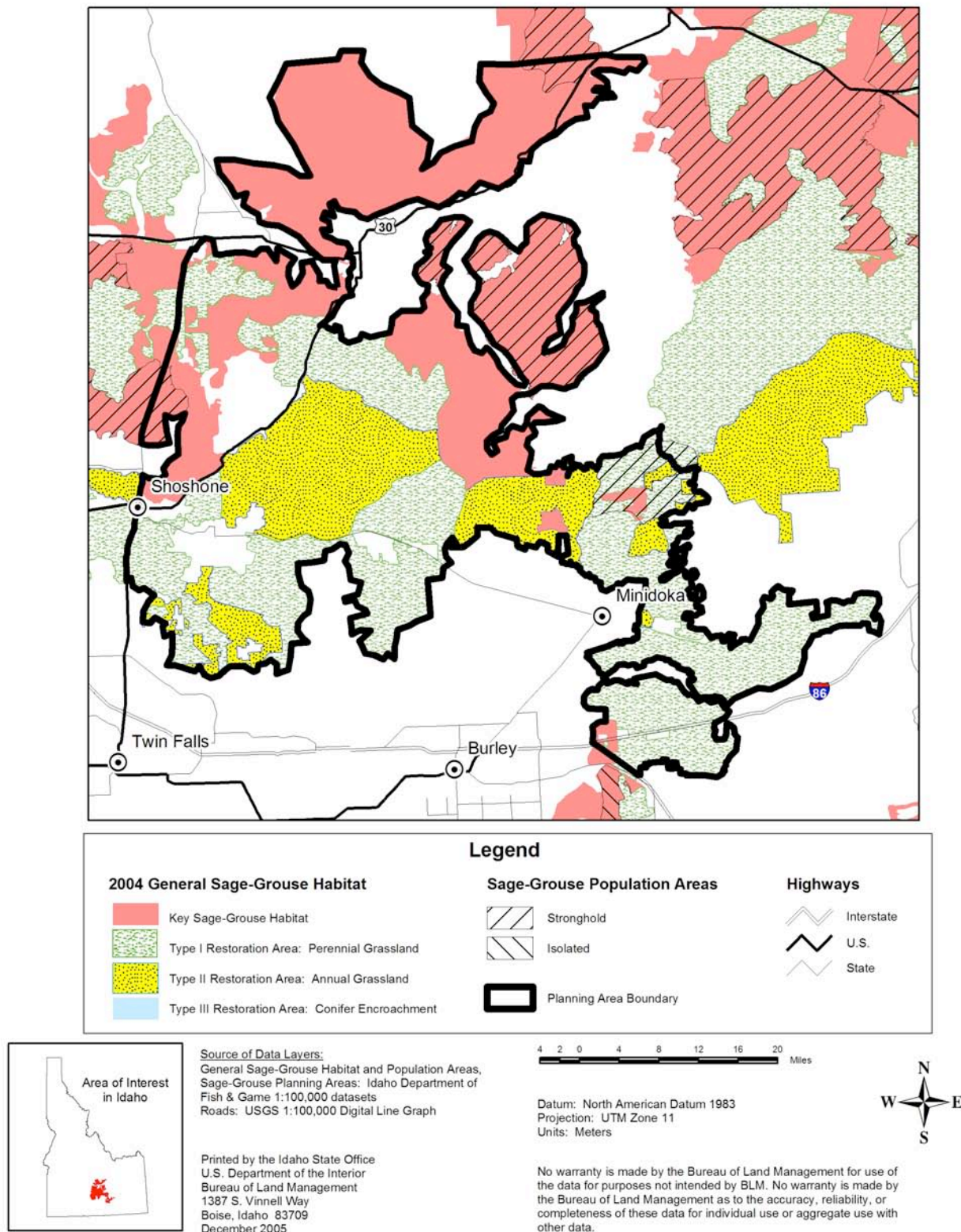


Figure 3-10 Map of East Magic Valley Sage-grouse Planning Area, 2004

### **3.2.1.8 Jarbidge SGPA**

#### **3.2.1.8.1 Population**

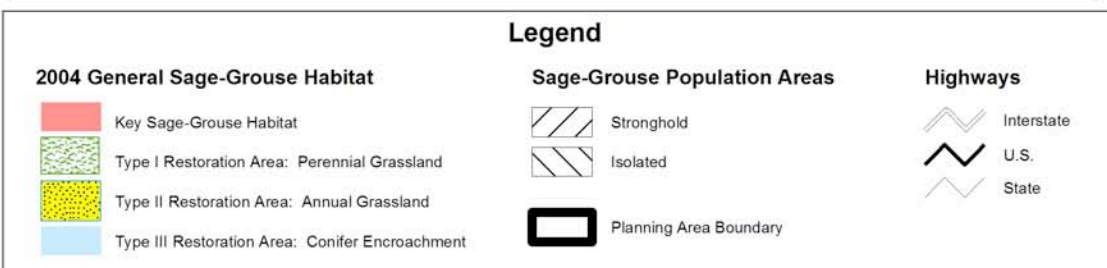
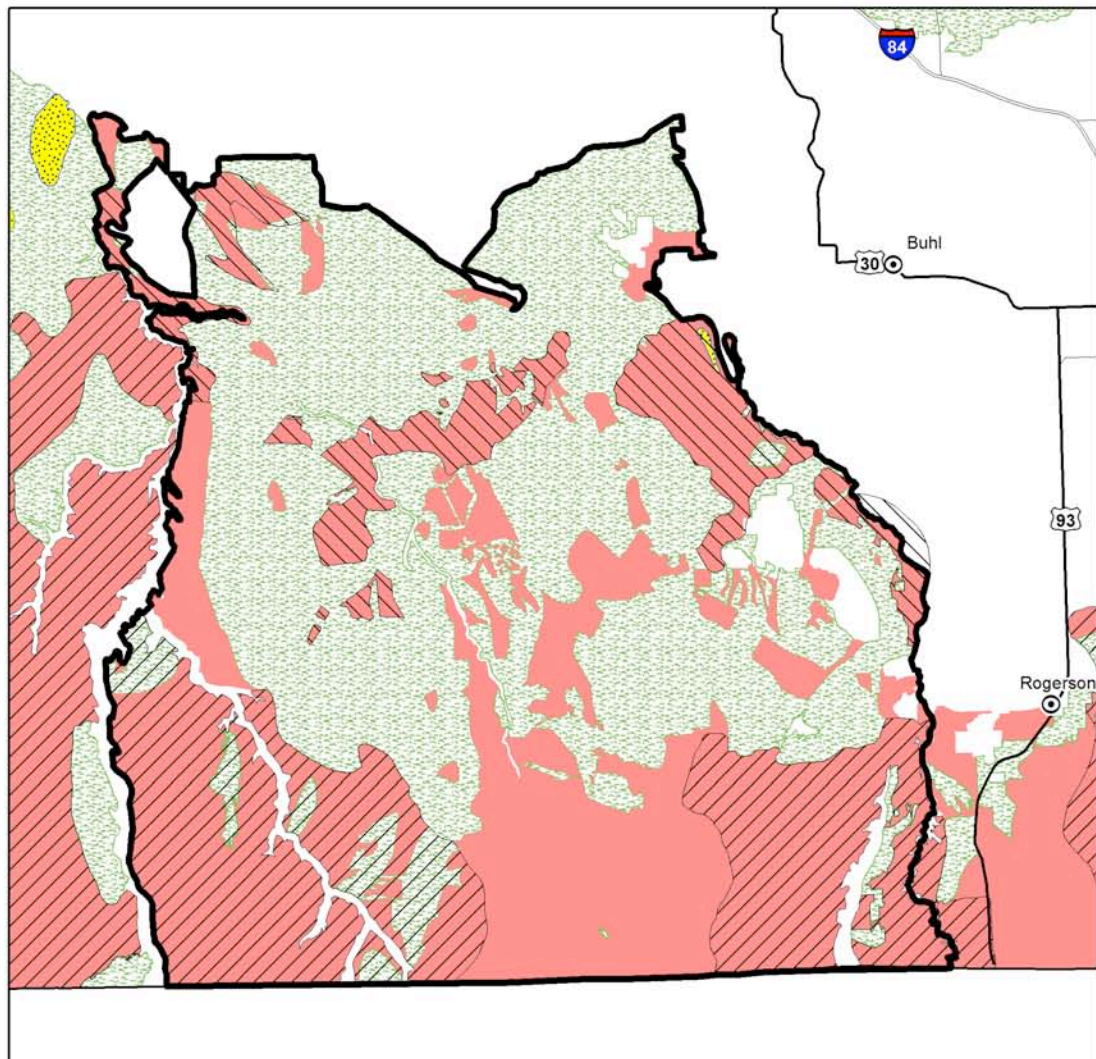
Lek data within the Jarbidge SGPA are too inconsistent to develop a trend graph. One lek route (Brown's Bench) located on the eastern edge of the SGPA has had consistent counts since 1992.

#### **3.2.1.8.2 Habitat**

The sage-grouse habitat within the Jarbidge SGPA (Figure 3-11) is about 1.2 million acres in size. The Bureau of Land Management administers 85% of the sage-grouse habitat within the area, 7% is private, 5% is managed by the State, and 3% is managed by the Department of Defense. Forty-nine percent of the planning area is classified as key sage-grouse habitat, 51% is dominated by perennial grasslands, and <1% is annual grasslands.



# Jarbridge Sage-Grouse Planning Area: 2004



Source of Data Layers:  
 General Sage-Grouse Habitat and Population Areas, Sage-Grouse Planning Areas: Idaho Department of Fish & Game 1:100,000 datasets  
 Roads: USGS 1:100,000 Digital Line Graph

Printed by the Idaho State Office  
 U.S. Department of the Interior  
 Bureau of Land Management  
 1387 S. Vinnell Way  
 Boise, Idaho 83709  
 December 2005

4 2 0 4 8 12 16 20 Miles

Datum: North American Datum 1983  
 Projection: UTM Zone 11  
 Units: Meters



No warranty is made by the Bureau of Land Management for use of the data for purposes not intended by BLM. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Figure 3-11 Map of Jarbridge Sage-grouse Planning Area, 2004

### **3.2.1.9 Mountain Home SGPA**

#### **3.2.1.9.1 Population**

Lek data within the Mountain Home SGPA are too inconsistent to develop a trend graph. Only 2 leks were counted annually between 1966 and 1990.

#### **3.2.1.9.2 Habitat**

The sage-grouse habitat within the Mountain Home SGPA (Figure 3-12) is about 277,000 acres in size. The Bureau of Land Management administers 58% of the sage-grouse habitat within the area, 27% is private, 12% is state, and 3% is administered by USDA Forest Service. Seventy percent of the area is classified as key sage-grouse habitat, 10% is dominated by perennial grasslands, and 20% is annual grassland.

# Mountain Home Sage-Grouse Planning Area: 2004

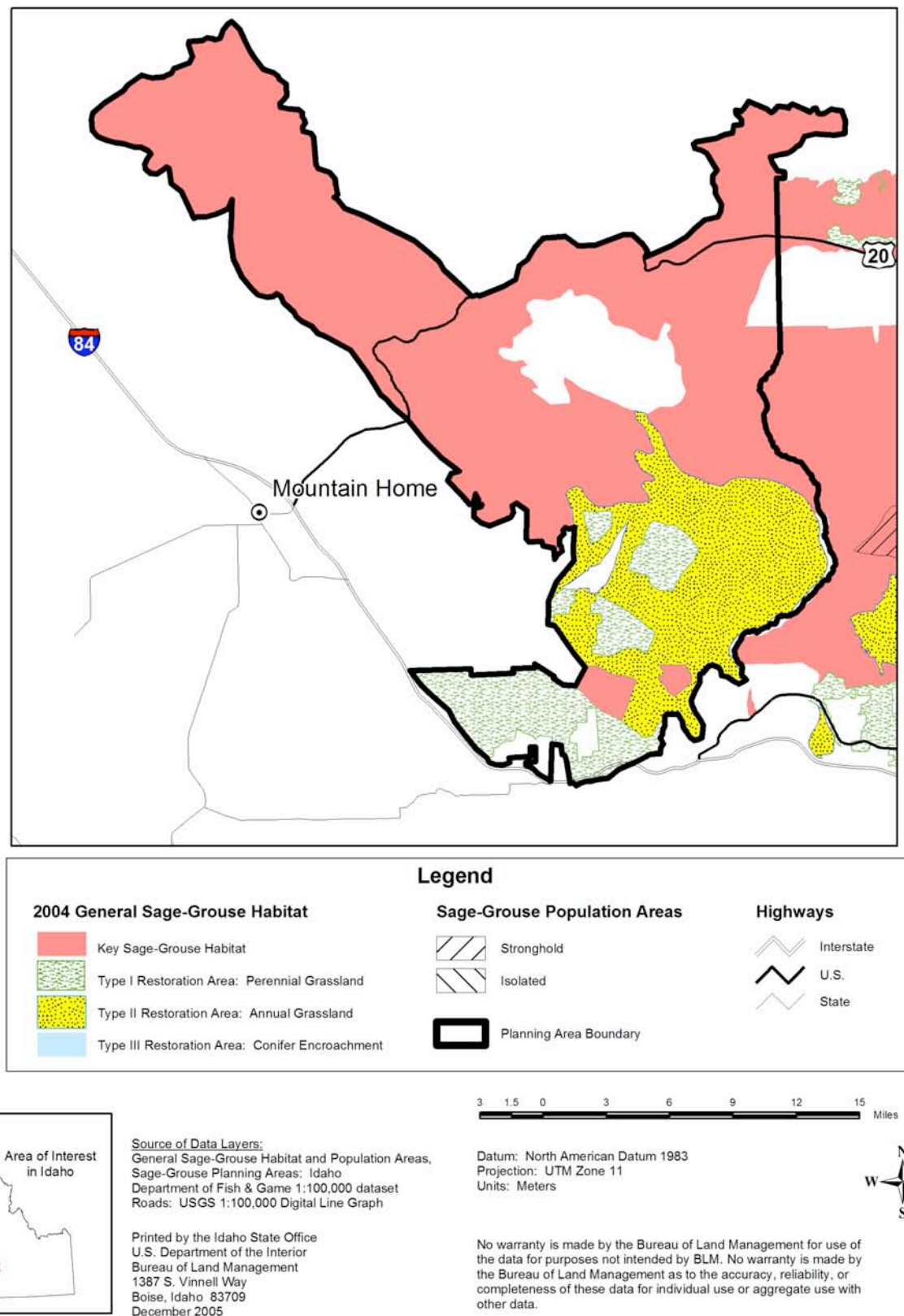


Figure 3-12 Map of Mountain Home Sage-grouse Planning Area, 2004

### **3.2.1.10 Owyhee SGPA**

#### **3.2.1.10.1 Population**

Lek data within the Owyhee SGPA are too inconsistent to develop a trend graph. Numerous individual leks have been inconsistently counted between 1966 and 2005. More consistent counts along established lek routes did not begin until 1998.

#### **3.2.1.10.2 Habitat**

The sage-grouse habitat within the Owyhee SGPA (Figure 3-13) is about 2.6 million acres in size. The Bureau of Land Management administers about 83% of the sage-grouse habitat within the planning area, 10% is private, 7% is managed by the State. Seventy-three percent of the planning area is classified as key sage-grouse habitat, 11% is dominated by perennial grasslands, 5% is annual grasslands, and 11% is conifer encroachment. Further refinements of this map will be possible in the near future, as a result of mapping efforts underway via the Great Basin Restoration Initiative's Owyhee Uplands project.



# Owyhee Sage-Grouse Planning Area: 2004

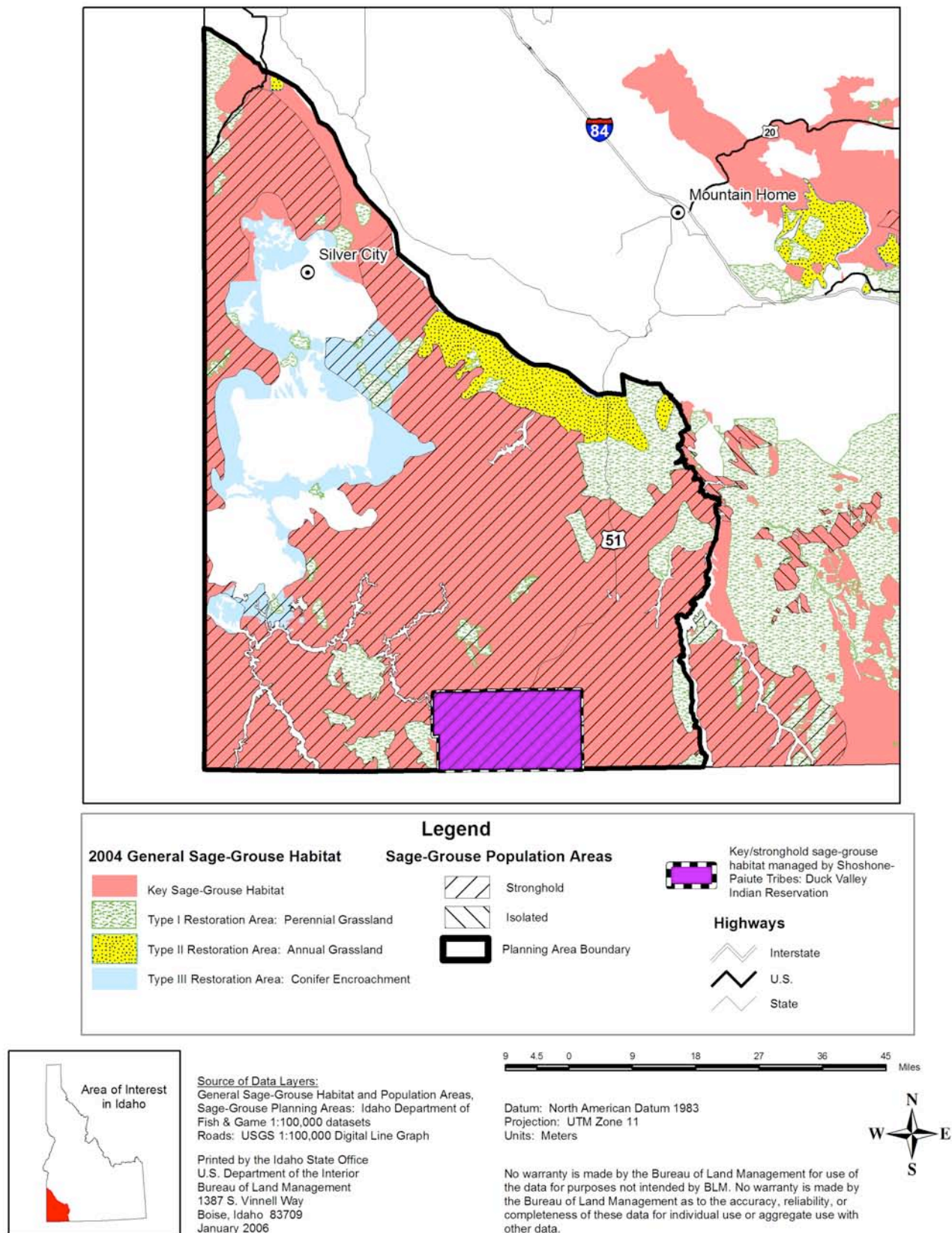


Figure 3-13 Map of Owyhee Sage-grouse Planning Area, 2004

### 3.2.1.11 Shoshone Basin SGPA

#### 3.2.1.11.1 Population

Figure 3-14 shows the average number of males per lek counted (includes all leks counted with zeros) from 1986-2005. The data used to develop Figure 3-14 includes all lek counts along the Shoshone Basin lek route. Prior to 1986, only 2 leks along the established route were counted annually.

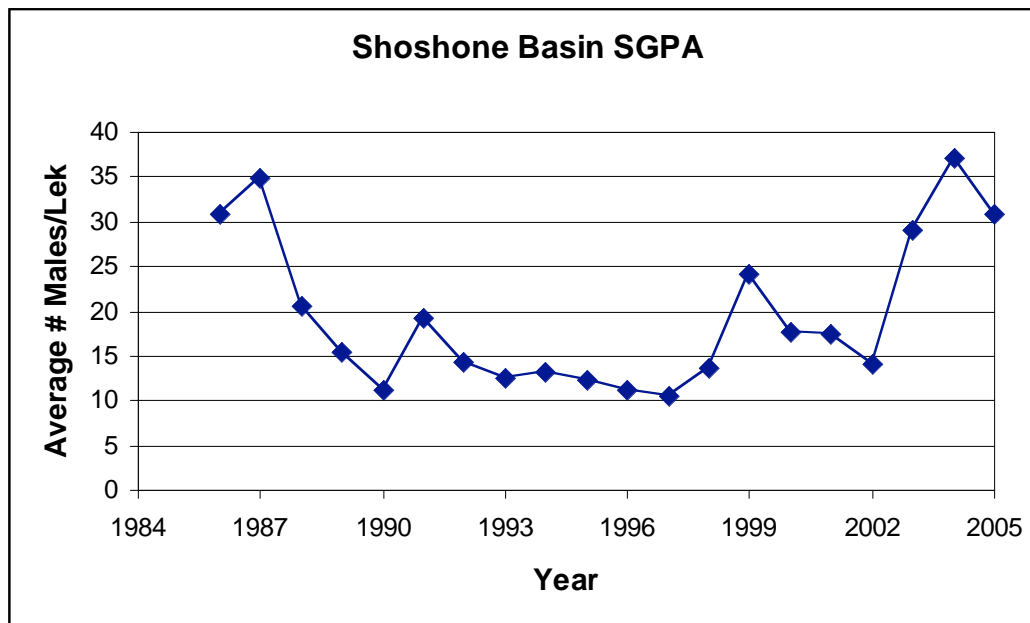


Figure 3-14 Changes in average number of males/lek 1986-2005, Shoshone Basin Sage-grouse Planning Area.

#### 3.2.1.11.2 Habitat

The sage-grouse habitat within the Shoshone Basin SGPA (Figure 3-15) is about 180,000 acres in size. The Bureau of Land Management administers 51% of the sage-grouse habitat within the area, 45% is private, 4% is managed by the State, and <1% is USDA Forest Service. Eighty-seven percent of Shoshone Basin is classified as key sage-grouse habitat and 13% is dominated by perennial grasslands.

# Shoshone Basin Sage-Grouse Planning Area: 2004

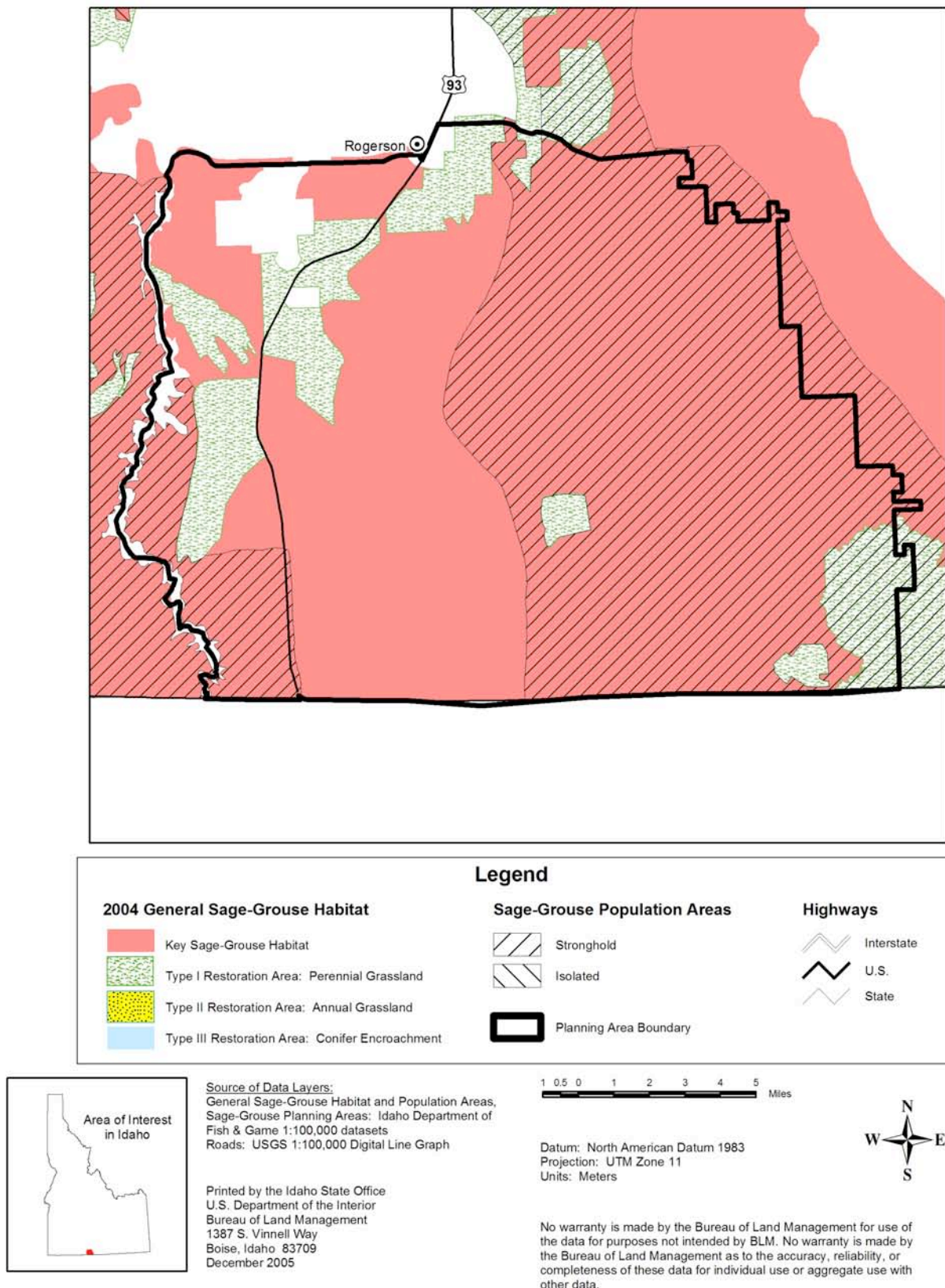


Figure 3-15 Map of Shoshone Basin Sage-grouse Planning Area, 2004



### **3.2.1.12 South Magic Valley SGPA**

#### **3.2.1.12.1 Population**

Lek data within the South Magic Valley SGPA are too inconsistent to develop a trend graph. Numerous individual leks were counted between 1980 and 2005. One lek route was developed in the mid 1990s.

#### **3.2.1.12.2 Habitat**

The sage-grouse habitat within the South Magic Valley SGPA (Figure 3-16) is about 761,000 acres in size. The Bureau of Land Management administers 48% of the sage-grouse habitat within the area, 21% is private, 5% is managed by the State, and 26% is managed by USDA Forest Service. Less than 1% is managed by the National Park Service. Sixty-five percent of the area is classified as key sage-grouse habitat, 24% is dominated by perennial grasslands, and 11% is conifer encroachment.

## South Magic Valley Sage-Grouse Planning Area: 2004

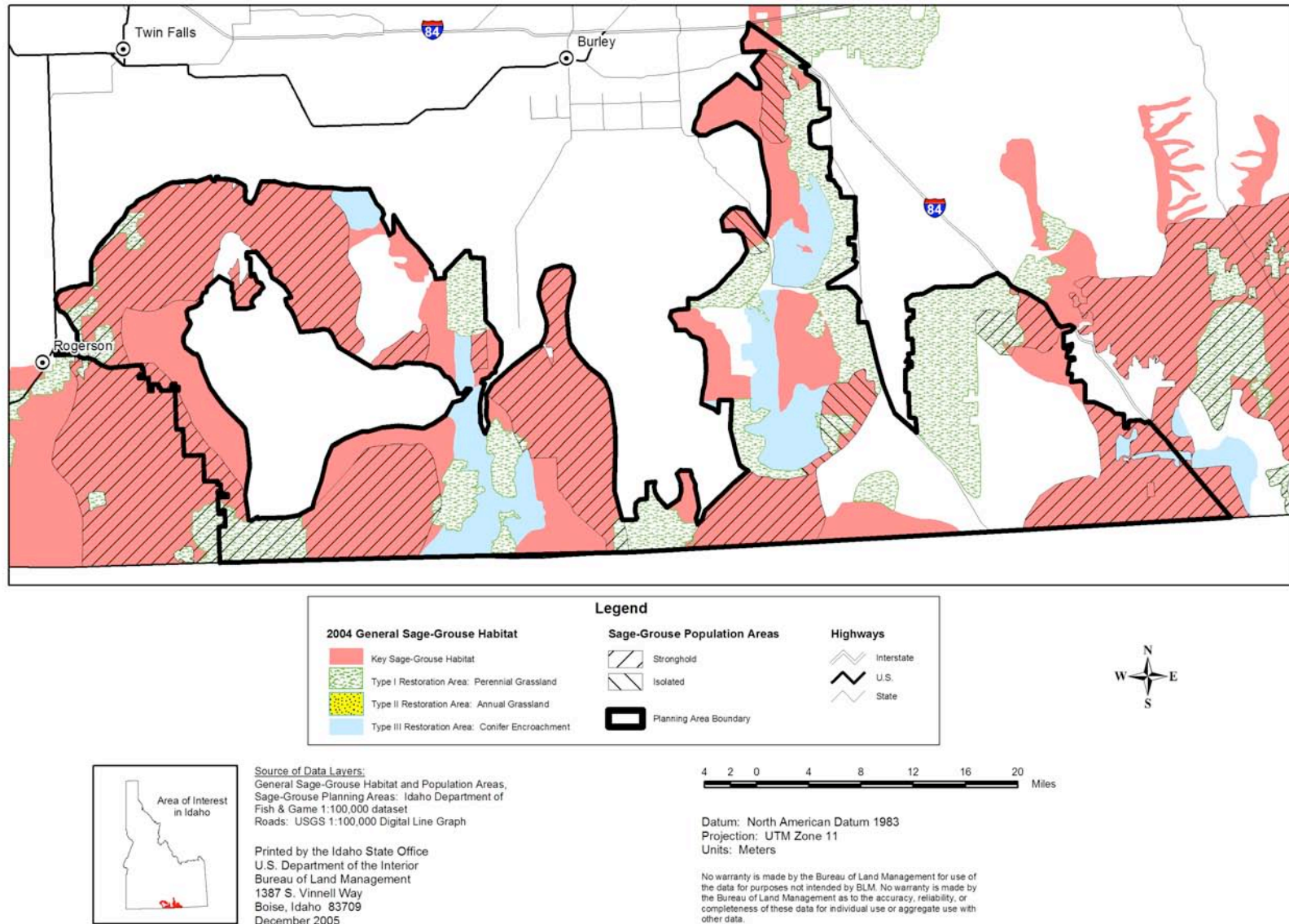


Figure 3-16 Map of South Magic Valley Sage-grouse Planning Area, 2004

### 3.2.1.13 Upper Snake SGPA

#### 3.2.1.13.1 Population

Figure 3-17 shows the average number of males per lek counted, using data collected between 1953-2005. Some of the lek routes used in the analysis were not initiated until the late 1980s-1990s. Analysis is inclusive of all leks counted with zero males. Data used to develop Figure 3-17 includes lek counts from 13 lek routes (Red Road, Sheep Station, Market Lake, Jacoby, Plano, Stibal Road, Table Butte, Lidy, Medicine Lodge, Crooked Creek, Upper and Lower Birch Creek, and Little Lost).

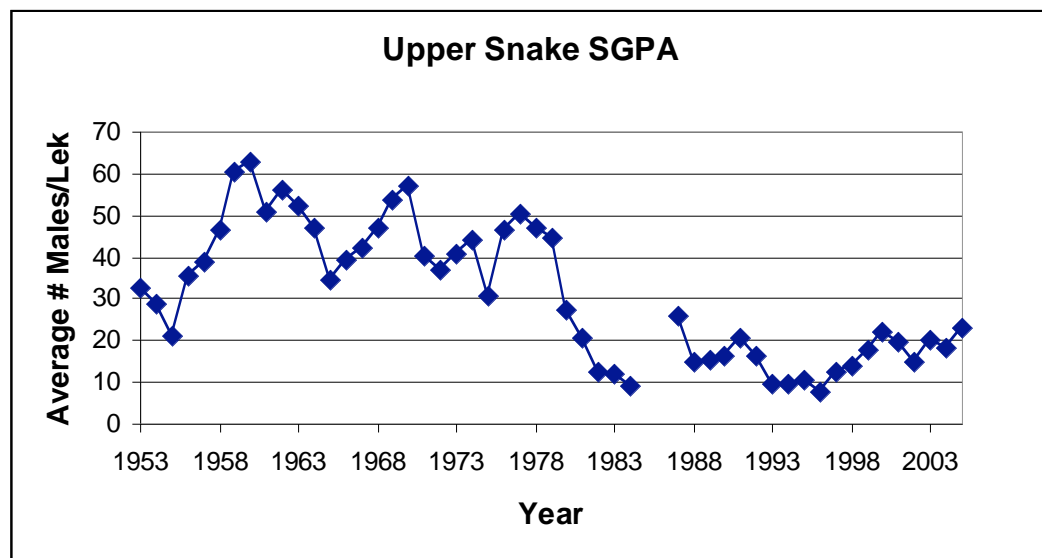


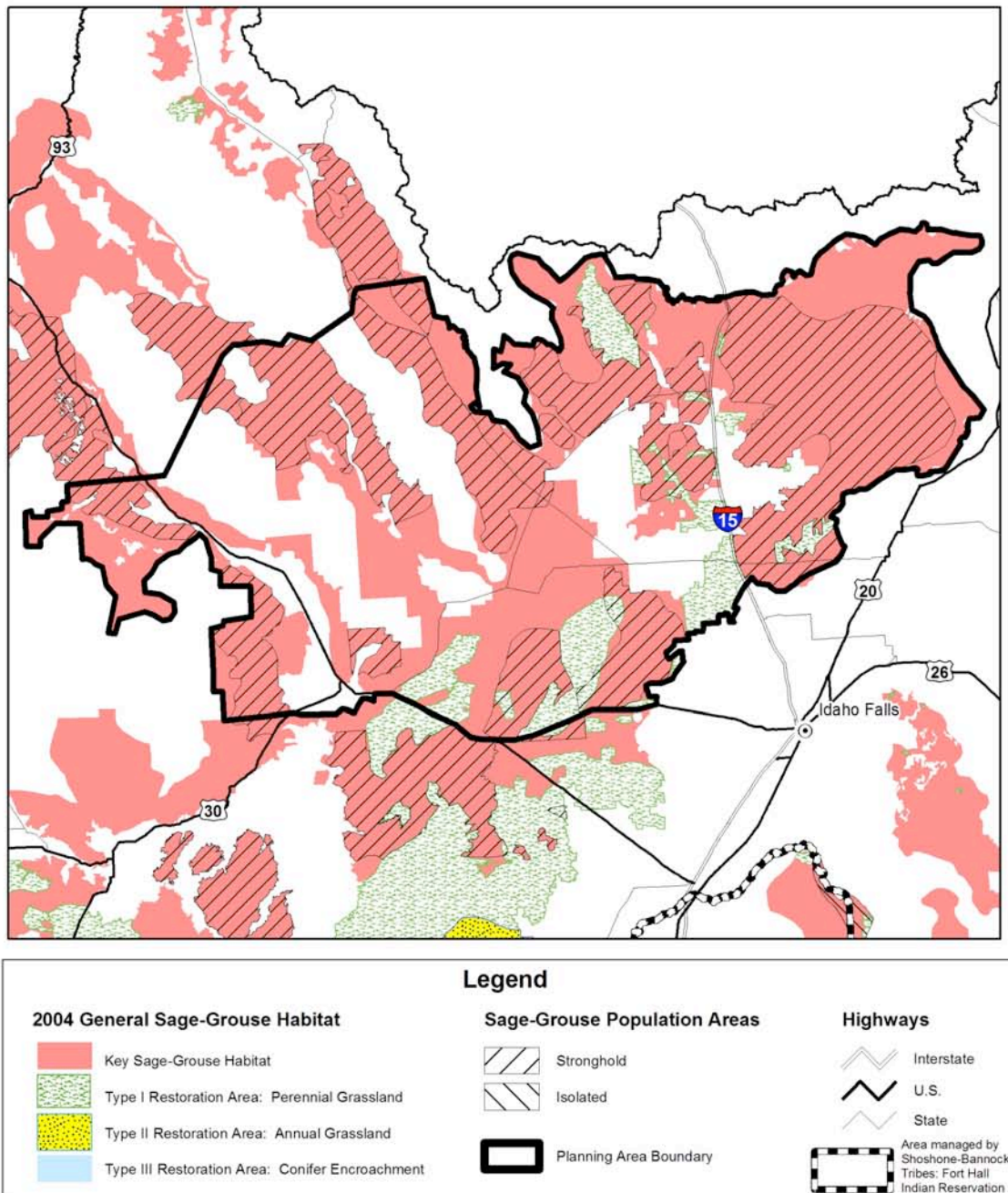
Figure 3-17 Changes in average number of males/lek 1953-2005 Upper Snake Sage-grouse Planning Area.

#### 3.2.1.13.2 Habitat

The sage-grouse habitat within the Upper Snake SGPA (Figure 3-18) is about 2.5 million acres in size. The Bureau of Land Management administers 47% of the sage-grouse habitat within the area, Department of Energy administers 18%, 17% is private, 8% is managed by the State, 9% is administered by USDA Forest Service, and <1% is administered by U.S. Fish and Wildlife Service. Ninety percent of the area is classified as key sage-grouse habitat and 10% is dominated by perennial grassland. Conifer encroachment areas likely exist, but have not been incorporated into the Sage-Grouse Habitat Planning Map, as of 2004. On the

Upper Snake River Plain, 29,762 ha (73,512 acres) of sagebrush rangeland were converted to cropland between 1975 and 1992 (Leonard et al. 2000). This represents an 11% loss of sage-grouse key habitat within the study area (this does not represent the entire Snake River SGPA). It should be noted that the Challis and Upper Snake LWG Plans both address habitat in the Big Lost drainage, from Willow Creek Summit to Pass Creek.

# Upper Snake Sage-Grouse Planning Area: 2004



**Source of Data Layers:**  
 General Sage-Grouse Habitat and Population Areas, Sage-Grouse Planning Areas: Idaho Department of Fish & Game 1:100,000 datasets  
 Roads: USGS 1:100,000 Digital Line Graph

Printed by the Idaho State Office  
 U.S. Department of the Interior  
 Bureau of Land Management  
 1387 S. Vinnell Way  
 Boise, Idaho 83709  
 January 2006

9 4.5 0 9 18 27 36 45 Miles

Datum: North American Datum 1983  
 Projection: UTM Zone 11  
 Units: Meters



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**Figure 3-18 Map of Upper Snake Sage-grouse Planning Area**



### **3.2.1.14 West Central SGPA**

#### **3.2.1.14.1 Population**

Lek data within the West Central SGPA are too inconsistent to develop a trend graph. Four lek routes established in the mid 1990s have had consistent counts since 1996.

#### **3.2.1.14.2 Habitat**

The sage-grouse habitat within the West Central SGPA (Figure 3-19) is about 875,000 acres in size. The Bureau of Land Management administers 32% of the sage-grouse habitat within the area, 62% is private, 6% is managed by the State, and less than 1% is administered by USDA Forest Service. Thirty-one percent of the area is classified as key sage-grouse habitat, 25% is dominated by perennial grassland, and 44% is classified as annual grassland. Much of the perennial grassland is dominated by native grasses with islands of sagebrush. A change in the classification from perennial grassland to key habitat may be appropriate for some portions of the SGPA, contingent on the extent of sagebrush cover, distribution of sagebrush islands or other factors. Field-level ground truthing of these areas in the near future is warranted because much of the native perennial grassland type does not need to be rehabilitated. The annual grassland type will need to be monitored for presence/absence of sage-grouse as some of the area may be unsuitable for rehabilitation to sagebrush habitat due to topography and terrain.

# West-Central Sage-Grouse Planning Area: 2004

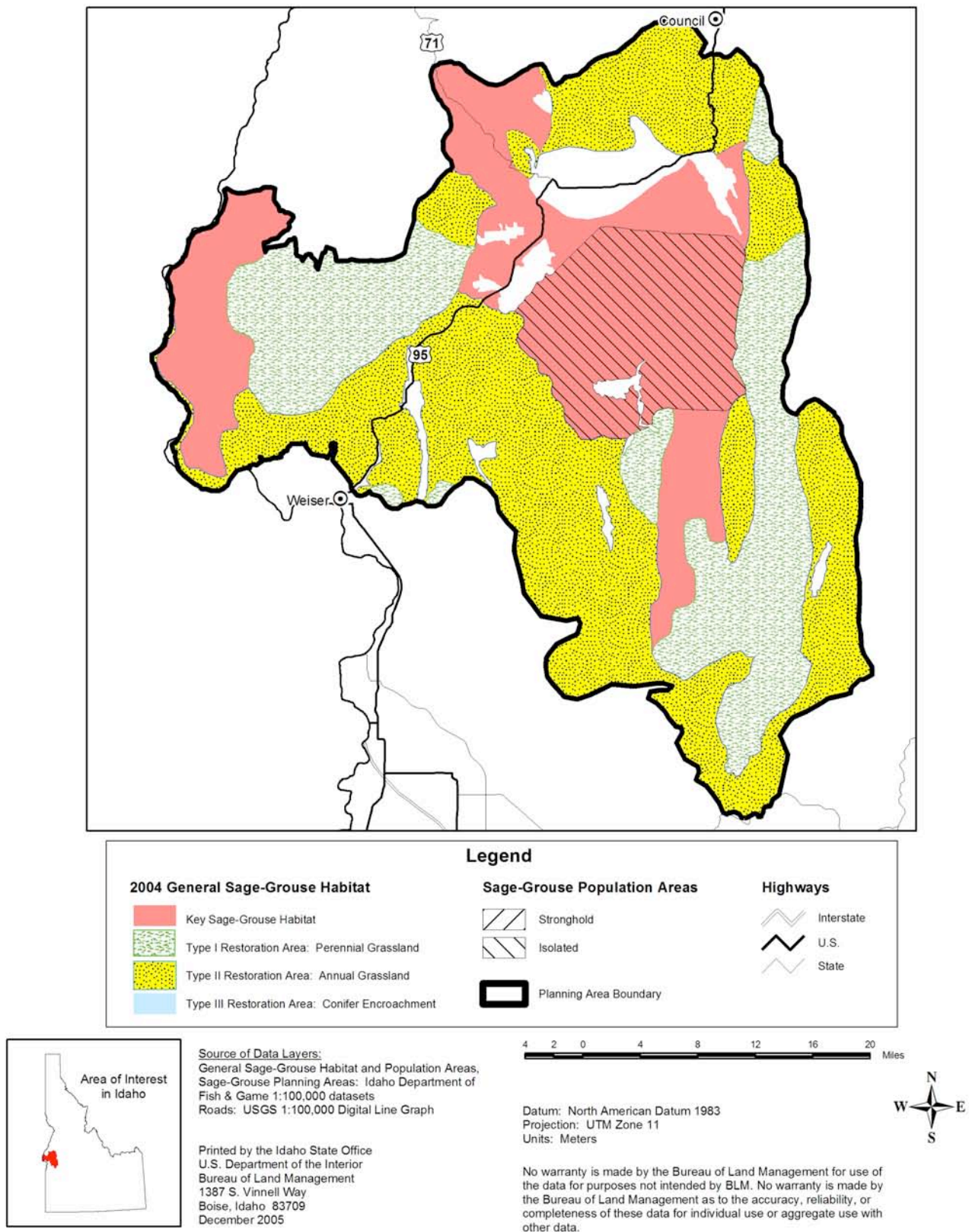


Figure 3-19 Map of West Central Sage-grouse Planning Area, 2004

### 3.2.1.15 West Magic Valley SGPA

#### 3.2.1.15.1 Population

Figure 3-20 shows the average number of males per lek counted (includes all leks counted with zero males) from 1976-2004. Data used to develop Figure 3-20 includes lek counts from North Shoshone, Rock Creek, and Bliss/Hill City lek routes.

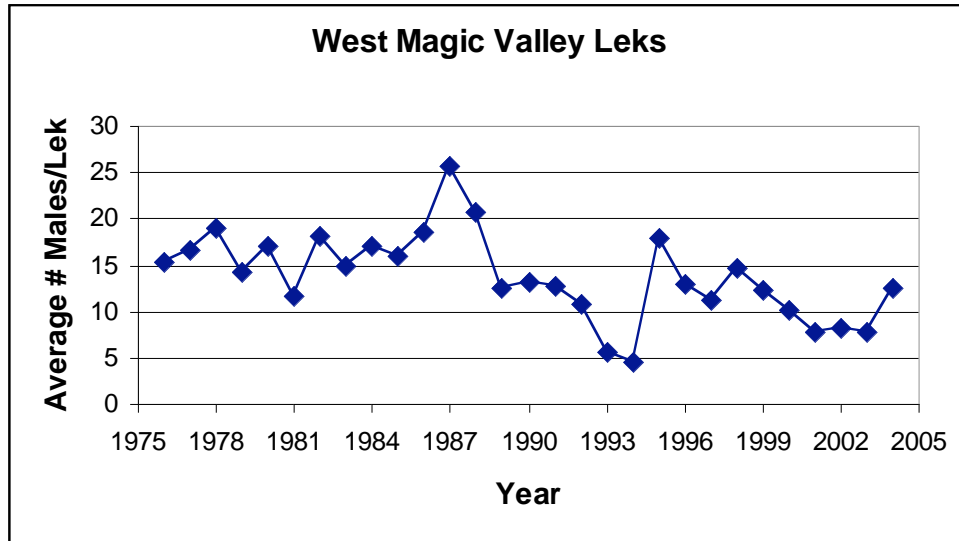


Figure 3-20 Changes in average number of males/lek 1976-2004, West Magic Valley Sage-grouse Planning Area.

#### 3.2.1.15.2 Habitat

The sage-grouse habitat within the West Magic Valley SGPA (Figure 3-21) is about 731,000 acres in size. The Bureau of Land Management administers 78% of the sage-grouse habitat within the area, 15% is private, and 7% is managed by the State. Less than 1% is administered by USDA Forest Service. Fifty-six percent of the area is classified as key sage-grouse habitat, 38% is dominated by perennial grasslands, and 6% is annual grassland.

# West Magic Valley Sage-Grouse Planning Area: 2004

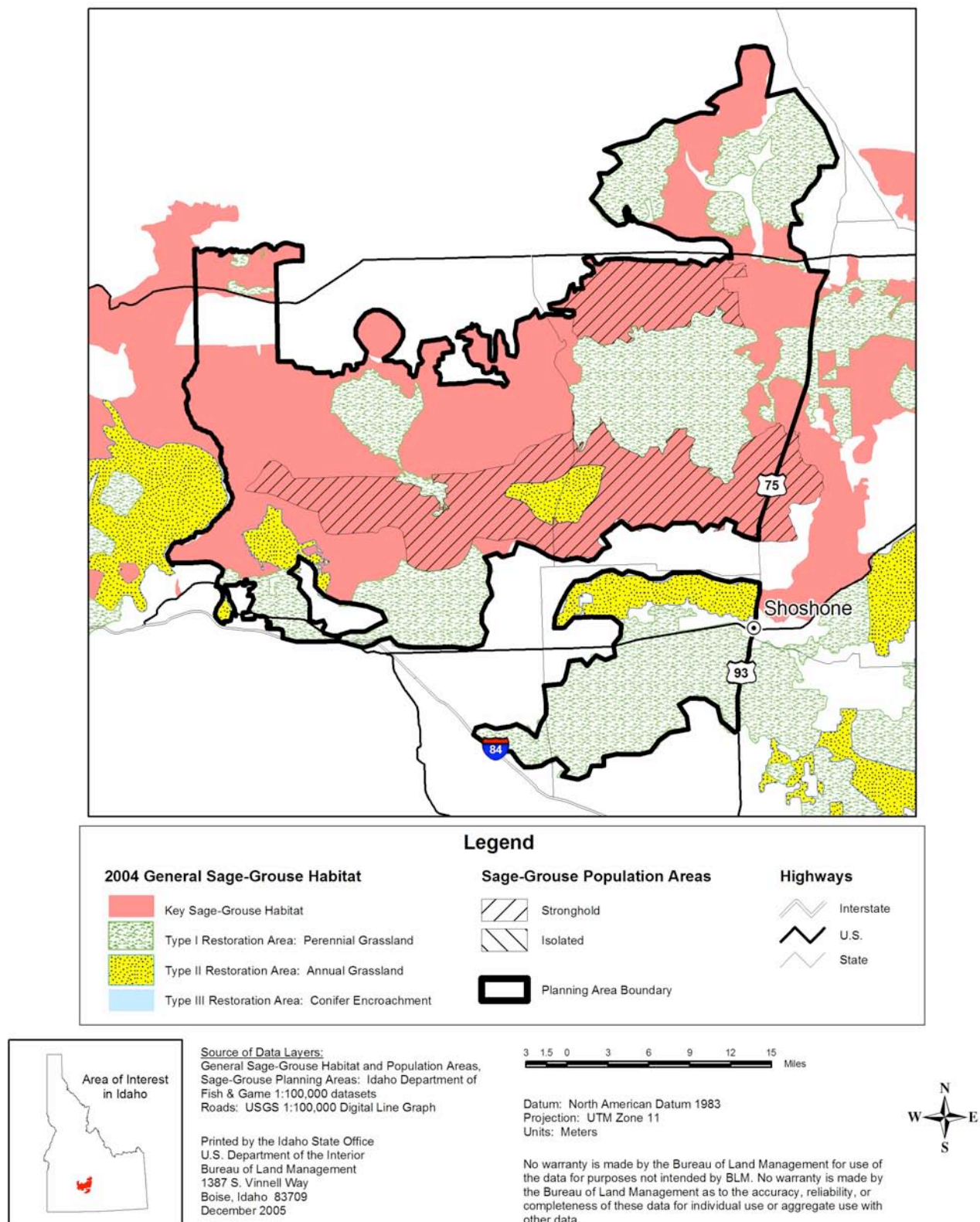


Figure 3-21 Map of West Magic Valley Sage-grouse Planning Area, 2004